

1/30

MPGFYEIVIKVPSDLDEHLPGISDSFVNWAKEWELPPDSMDLNLIEQAPLTVAEKLQDRFL
TEWRRVSKAPEALFFVQFEKESYFHMHLVETTVGKSMVLGRFLSQIREKLIQRIYRGIEPTL
PNWFAVTKTRNAGAGGNKVVDECYIPNYLLPKTPQELQWANTNMEQYLSACLNLTERKRLVAQH
LTHVSTQTEQENKQNPNSDAPVIRSKTSARYMELVGWLVKGTISEKQWIEDQASYSIFNAA
SNSRSQIKAALDNAGKIMSLTKTAPDYLVGQQPVEDISSNRIYKILELNGYDPQYASVFLGWA
TKKFKGRNTIWLFGPATTKTNTIAEALIAHTVPFYGCNVWNTNENFFNDVCVKMVIWEEGKMTA
KVVESAKAILGGSKVRVDQKCKSSAQIDPTFVIVTSTNTNMCVIDGNSSTTFEHQQLQDRMFKE
ELTRRLDHDHFGKVTQKQEVKDFFRWAKDHVVEVEHEFYVKKGGAKKRPA PSDADI SEPKRVRVSE
AQPSTSDAEASINADRYQNKCSRHVGMNMLMFLPCRCERMNQNNSICFTHGQKDCLECFPVSE
SQPVSVVKKAYQKLCYIHHIMGKVPDCTACDLNVNVDLDDCIFEQZ

FIG._1

atgccccgggttttacgagattgtgattaaaggtccccagcgaccttgacgagcatctgccccgca
ttctcgacagctttgtgaactgggtggccgagagaaggaatgggagttgcccgcagattctcgacat
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acgggaatggcgccgtgtgagtgaagcccgaggccctttctttgtgcaatttgagaaggag
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agtgtcatatccccaaattacttgcgtcccccacccagcctgagctccagttggcggtggactaa
tatgggaacagattttaaagccctgtttgaacttcacggagcgtaaacgggttggtggcgagcat
ctgacgcacgtgttcgcagacgcaggagcagacaaagagaatcagaatccccaaactctgatgcgc
cggtgacagatcaaaaacttcagccaggtacatggagctgggtgggtcgtcgtggacaaggg
gattacctcggagagaagcagtggtccaggaggaccaggcctcatcatctccttcaatcgccg
tccaactcgcggttccaaactcaaggctgccttggacaactcggggaagaattatgacctgacta
aaaccgccccgactacctggtggcccgacagcccggtggaggacatttccagcaatcggattta
taaaattttggaactcaaacgggtacgatccccaaatctggcgcttccgctcttctgggagtgggc
acgaaaaagtctcgggcaagaggaacaccatctggctgtttggcgctgcaactccgggaagacca
acatcgcggagccatagccacacatgtgccccttctacgggttgcgaactggacccaatcgagaa
ctttcccttcaacagcatgtctgcagaagatgggtgatctggtggaggagggaagatgaccgc
aaggtcgtggagtcggccaaagccatctcggaggaaagcaaggtgcgcggtggaccagaaatgca
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gattgacgggaactcagacaccttcgaacacacagcagccggttgcaagaccggatgttcaaat
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tcgggtgggcaaaagatcacgtggttgaggtggagcatgaattctacgtcaaaaagggtggagc
caagaaaaagaccgcgcacgtgagcgcagatataagtgagcccaacgggtgcccagtgagtcag
tcgcagcctcatcgactcagcgcagcgggaagcttcgatcaactacgcagcaggtaccacaaacaaat
gttctcgtcacgtgggcatgaatctgatgctgtttccctgcagacaatgcgagagaatgaatca
gaattcaaatatctgcttcaactcaggacagagaagatgctttagagtgtcttccggttcagaa
ttcacaactgtctcgttcgtaacaaaggcgtatcagaaactgtgctaatcatcatcatcatggy
gaaaggtgcacagcgttcgactgcctgcgatctggtcaatgtggatttggatgactgcattt
tgaacaataa

FIG._2

MPGFYEIVIKVPSDLDEHLPGISDSFVNWAKEWELPPDSMDLNLIEQAPLTVAEKLQDRFL
TEWRRVSKAPEALFFVQFEKESYFHMHLVETTVGKSMVLGRFLSQIREKLIQRIYRGIEPTL
PNWFAVTKTRNAGAGGNKVVDECYIPNYLLPKTPQELQWANTNMEQYLSACLNLTERKRLVAQH
LTHVSTQTEQENKQNPNSDAPVIRSKTSARYMELVGWLVKGTISEKQWIEDQASYSIFNAA
SNSRSQIKAALDNAGKIMSLTKTAPDYLVGQQPVEDISSNRIYKILELNGYDPQYASVFLGWA
TKKFKGRNTIWLFGPATTKTNTIAEALIAHTVPFYGCNVWNTNENFFNDVCVKMVIWEEGKMTA
KVVESAKAILGGSKVRVDQKCKSSAQIDPTFVIVTSTNTNMCVIDGNSSTTFEHQQLQDRMFKE
ELTRRLDHDHFGKVTQKQEVKDFFRWAKDHVVEVEHEFYVKKGGAKKRPA PSDADI SEPKRVRVSE
AQPSTSDAEASINADRYQNKCSRHVGMNMLMFLPCRCERMNQNNSICFTHGQKDCLECFPVSE
SQPVSVVKKAYQKLCYIHHIMGKVPDCTACDLNVNVDLDDCIFEQZ

FIG._3

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atgccgggggttttacgagattgtgattaaaggtccccagcgaccttgacgagcatctgcccgca
 ttcttgacagcttttgtaactgggtggccgagaaggaaatgggagttgcccgagatttgatcat
 ggtatctgaactctgattgagcaggcaccacctgacctggccgagaagctgcagcgagactttctg
 acggaatgggcccgtgtgagtaaggccccggaggcccttttcttctgtgcaatttgagaagggag
 agagctacttccacatgcagtgctcgtggaaaccacggggtgaaatccattggttttgggacg
 ttctctgagtcagattcgcgaaaaactgattcagagaatttaccgcgggacgagccgactttg
 ccaaactggttcgcgggtcacaaagaccagaaatggcgccggaggcggaacaagggtggtgag
 agtgctacatcccccaattacttctgtccccaaaaccagcctgagctccagtgggcggtggactaa
 tatggaacagttatttaagcgctctgttgaatctcaccggagcgtaaacgggttggtggcgagcat
 ctgacgcacgtgtcgcagacgcaggagcagaaacaaagagaatcagaatcccaattctgatgcgc
 cgggtgatcagatcaaaaacttcagccaggtacatggagctggtcgggtggctcgtgggacaaggg
 gattacctcgagaaagcagtggtggtccaggaggaccaggcctcatatcctcctcaatgcggcc
 tccaactcgcggtcccaaatcaaggctgccttggaacaatgcgggaaagattatgagcctgacta
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 taaaattttggaactaaacgggttacgatcccccaatcgcggttccgctcttctctgggattgggccc
 acgaaaaagttcggcaagaggaacaccatctgggtctgttgggctgcaactaccggggaagacca
 acatcgcggaggccatagcccacactgtgcccttctacgggtgcgttaaacgggacaaatgagaa
 ctttcccttcaacgactgtgtcgacaagatggtgatctcgggtgggaggagggggaagatgaccgcc
 aaggtcgtggagtgcggcacaagccattctcggaggagcaaggctgcgctggaccagaaatgca
 agtctcggcccagatagaccgactcccgatcgctcactccaacaccaacatgtgcgcggt
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 gaactcaccgcccgtctggatcatgactttgggaaggtcaccagcagggaagtcaaagactttt
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 caagaaaagaccgccccagtgacgcagatataagtgagcccaacgggtgcgcgagctcatt
 ggcgcagccatcgagctcagacgcggaagcttcgatcaactacgcagacaggtaccaaaacaaat
 gttctcgtccagtgggcatgaatctgatgctgttccctgcagacaatgcgagagaaatgaatca
 gaattcaaatactcgtcttcaactacggacagaaagactgttagagtgcttcccggtgcagaa
 tctcaaccgctttctgtcgtcaaaaaggcgtatcagaaactgtgctacattcatcatatcatgg
 gaaaggtgccagacgcttgcaactgcctgcgactcgtggtcaatgtggatttgatgactgcatctt
 tgaacaataa

FIG._4

MPGFYEIVLKVPSDLDEHLPGISDSFVSWVAEKWELPPDSMDMLNLIEQAPLTVAEKLQREFL
 VEWRRVSKAPEALFFVQFEKGDYSFHLHILVETVGKSMVVGVRYSQIKEKLVTRIYRGVPEQL
 PNHFAVTKTRNGAGGKNKVVDDCYIPNYLLPKTQPELQAWTNNMDQYISACNLAEKRLVAQH
 LTHVSQTQEQNKENQNPNSDAPVIRSKTSARYMELVGLVDRGITSEKQWIQEDQASYISFNAA
 SNSRSQIKAAALDNASKIMSLTKTAPDYLVGQNPPEDISNRIYRILEMNGYDPQYAAVSFLGWA
 QKFGKRNTIWLFGPATTKGTNTIAEAIAHAVFFYGCNVNENFFPNDCKVMVIWVEGKMTA
 KVVESKAKAILGGSKVRVDQKCKSSAQIDPTPVIVTSNTNMCAVIDGNSTTFEHQQPLQDRMFKF
 ELTKRLEEDFGKVTQEVKDFRWASDHVTEVTHEFYVRKGGARKRAPNDADISEPKRACPVS
 AQPSTSDAEAPVDYADRYQNKCSRHVGMNMLLFPCCRQCERMNQNVDCIFTHGVMDCAECFPVSE
 SQPVSVVRKRTYQKLCPIIHIMGRAPEVACSACELANVDLDDCDMEQ

FIG._5

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atgccccgggttctacgagatcgtgctgaaggtgccagcgacctggacgagcactgccccgca
 tttctgactcttttctgagctgggtggccgagaaggaatgggagctgcccgagattctgacat
 ggacttgaatctgattgacgagcgaccctgacgctggccgaaagctgcacgagagttctctg
 gtcgagtgccgcccgtgtgagtaagggccccggaggccctcttcttctgacagtgcagaaagggg
 acagctacttccacctgcacatcctggtggagaccgtggggcgtcaaatccatggtggtgggccc
 ctacgtgagccagattaaagagaagctggtgacccgcatctaccgccccgggtcgagccgagctt
 ccgaactggttgcgggtgaccaagacgctaatggcgccggaggccggaacaaggtggtggacg
 actgctacatcccccaactacctgctcccccaagaccagcccgagctccagtggtgggactaa
 catggaccagttataaagcgctgttgaatctcgcggagcgtaaacggctggtggcgagcat
 ctgacgcacgtgtcgcgacgagcagacagaacaaggaaaccagaaacccaattctgacgcgc
 cggtcacaggtcaaaaacacctccgcccaggtacatggagctggtcggtggtggtggaccgccc
 gatcacgtcagaaaagcattggatcaggaggaccagggctcctacatctccttcaacgcccgc
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 aaggtcgtagagagcgcgaagccatcctggggcgaagcaaggtgcgctggaccaaaagtgcg
 agtcatcgcccagagatcgaccccaactcccgtagctgcacctccaaacacaaatgtgcccgt
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 tccggtgggctcagatcacgtgacggaggtgactcacgagttttagctcagaaggggtggagc
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 ggcagccatcgacgtcagacggggaagctccggtggactacgcccagcaggtaccacaaacaaat
 gttctcgtcacgtgggtatgaatctgatgcttttccctgccggcaatgctgagagaatgaatca
 gaatgtggacatttgcctcacgcacggggtcatggactgtgcccagcttcccggtgcagaa
 tctcaaccggtgtctgctcagaaagcggacgtatcagaacatgtgtccgattcatcacatca
 tggggaggcccccagaggtggcctgctcggcctcggaactggccaatgtggacttggatgactg
 tgacatggaacataa

FIG._6

MPGFYEIVLKVPSSDLDEHLPGISNSFNWVAEKEWELPPDSMDPNLIEQAPLTVAEKQREFL
 VEWRRVSKGPELFFVQFKEGETYFHLVLIETIGVKSVMVGRVVSQIKEKLVTRIYRGVPEQL
 PNWFAVTKTRNAGGKNVVDCCYIPNYLLPKTQPELQWANTNMDQYLSACLNLAERKRLVAQH
 LTHVSQTQEONKENQNPNSDAPVIRSKTSARXMEVLVGLVDRGITSEKQWIQEDQASYISFNAA
 SNRSRQIKAALDNASKIMSLTKTAPDYLVGSNPPEDITKNRIYQILELNGYDPQYAAVSFLGWA
 QKKFGKRNITWLFPGPATGTGRTNIAEALAHAVPFYGCNVNTNENFFNDVCVKMVIWEEGKMTA
 KVVESAKAILGGSKVRVDQKCKSSAQIEPTPIVTSNTNMCAVIDGNSSTTFEQQPLQDRMFKF
 ELTRRLDHDHFQKVTKQEVKDFRWASDHVTDVAHEFYVRKGGAKKRPASNDADVSEPKRQCTSL
 AQPTTSDAEAPADYADRYQNKCSRHVGMNLMLEPCKTCERMNQISNVCFTHGQRDCGECFFGMS
 ESQPVSVVKKKTYQKLCPIHHILGRAPEIACSACDLANVLDLDCVSE

FIG._7

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atgcgggggttctacgagattgtcctgaaggtcccagtgacctggacgagcacctgccgggca
 tttctaactcgtttgtttaactgggtggccgagaaggaatgggagctgccgccggattctgacat
 ggatccgaatctgatttgagcagcaccctgacgtggccgaaaagcttcagcgcgagttcctg
 gtggagtgggcccgctgagtaaggcccccggaggccctctttttgtccagttcgaaaaaggggg
 agacctacttccacctgacgtgctgattgagaccatcgggggtcaaatccatggtggtcgccg
 ctacgtgagccagattaaagagaagctggtgaccgcgcatctaccgcgggggtcgagccgcagctt
 ccgaactggtttcgcggtgacccaaaacgcgaaatggcgccggggggcggggaacaaggtggtggac
 actgctacatccccaaactacgtctctcccaagaccagcccgagctccagtgggcgtaggactaa
 catggaccagttttaagcgcctgtttgaatctcgcggagcgtaaaacggctggtggcgagcat
 ctgacgcacgtgttcgcagacgcagcagcaacaagagatacgaaccccaattctgacgcg
 cggatcatcaggttcaaaaacctcagccaggttacatggagctggtcggggtggtggtgacccg
 gatcacgtcagaaaaacatggattcaggaggaccaggcctcgatcatctcttcaacgcgcgc
 tccaactcgcggtcccagatcaaagccgcgctggacaatgctcccaagatcatgagcttgacaa
 agacggctccggactacctggtgggcagcaacccgcggaggacattacaaaaactcgatcta
 ccaaatcctggagctgaacgggtacgatccgcagtagcgggctcctcttctgggtggggc
 caaaagaagttcgggaagaggaacaccatctggctctttgggcccgcacgacgggtaaaacca
 acatcgcggaagccatcgcccacgcgcgtgacctctacggctcggtaaactggaccaatgaa
 ctttcccttcaacgattgctgcgacaagatggtgatctggtggggaggagggcaagatgacggcc
 aaggtcgtggagagcgccaaaggccattctggggcggaagcaagtgcgcggtggaccaaaagtga
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 tccggtgggcttcgatcacgtgactgacgtggctcatgagttctacgtcagaaaaggtggagc
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 gcgcagccgacaacgtcgacgcgcggaagcaccgcggactacgcgcaggtaccaaaacaaat
 gttctcgtcacgtgggcatgaatctgatgctttttccctgtaaaacatgcgagagaatgaatca
 aatttccaatgtctgttttacgcagtggtcaaagagactgtggggaatgcttccctggaatgta
 gaatctcaaccggtttctgctgctcaaaagaagacttatcagaaactgtgtccaattcatcata
 tctctggaaggccaccgcagattgctgttcggcctcgatttgccaatgtggacttgatga
 ctggtttctggagcaataa

FIG._8

MPGFYEIVLKVPSDLDERLPGISNSFVNWVAEKEWDVPPDSMDPNLIEQAPLITVAEKLQREFL
 VEWRRVSKAPEALFFQFEKGETYFHLHVLIETIGVKSVMVGRVVSQIKEKLVTRIYRGVEPOL
 PNWFAVTKTRNGAGGONKVVDDCYIPNYLLPKTQPELQWAWTNMDQYLSACLNLAEKRLVAQH
 LTHVSQTQEONKENQNPNSDAPVIRSKTSARYMELVGWLVDRGITSEKQWQEDQASYISFNAA
 SNSRSQIKAAILDNASKIMSLTKTAPDYLVGSNPPEDITKNRIQIILELNGYDPPQYAAVSFLGWA
 QKKFGKRNTIWLFGPATGTGTNIAEALAHAVPFYGCNVNWTNENFPFNDVCVKMVIWWEKGMTA
 KVSESAKAILGGSKVRVDQCKSSAQIEPTFVIVTSNTNMCAVIDGNSSTTFEHQQLQDRMFEF
 ELTRRLDHDHFGKVTQGEVKDFFRWASDHVTDVAHEFYVRKGGAKRPA SNADADVSEPKRECTSL
 AQPTSDAEAPADYADRYQNKCSRHRVGMNMLFPCKTCERMNQINSVCTHGRDRCGECFPGM
 ESQPVSVYKKKTYKLCPIBHILGRAPEIACSACDLANVLDLDCVSEQ

FIG._9

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atgccccgggttctacgagattgtcctgaaggtcccgagtgacctggacgagcgccctgccgggca
 tttctaaactgtttgttaactgggtggccgagagaaggaatgggacgtgccgcccagattctgacat
 ggatccgaatctgtattgagcagccaccctgacctggccgaaaagcttcagcgcgagttcctg
 gtggagtgggccgctgtgagtaaggccccggaggccctctttttgtctcaggttcgaaaaagggg
 agacctacttccacctgacgtgtgtattgagaccatcggggtcaaatccatggtgtgtcgccg
 ctacgtgagccagattaaagagaaagctgggtgacctgcatctaccgccccgtcgagccgcagctt
 ccgaactggttcgcggtgacccaaacgcggaatggcgccgggggccccgaacaggtgtgtgacg
 actgtctacatccccactacctgtctcccaagaccagccccgagctcagctggcgctggactaa
 catggaccagtttttaagcgctgttttgaatctcgccggagcgttaaacggctggttggcgagcat
 ctgacgcacgtgtcgagacgcaggagcagaacaaagagaatcagaacccaattctgacgcgc
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 gatcagctcagaaaaagcaatggattcaggaggaccaggcctcgtacatctccttcaacgcgcgc
 tccaactcgcggtcccgatcaaggccgctggtgacaatgcctccaagatcatgagcctgacaa
 agacggctccggactacctggtggggcagcaacccgcgcggaggacattaccaaaaactcggtacta
 ccaaatctggagctgaacgggttcagatccgagtcacggcctcgtctctcctgggctgggctg
 caaaaagaagttcgggaagaggaacaccatctggctctttggggccggccacgacgggttaaacc
 acatcgccgaagccatcgccacgcgcgtgcctctctacggctgcgtaaactggaccaatgagaa
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 aaggtcgtggagagcgccaaggccattctggggcggaagcaaggtgcgcgtggacaaaaagtga
 agtcatcggtccagatcgaacccactcccgtagctgcctcaccaccaacacatgctggccggt
 gattgacgggaacagcaccaccttcgagcatcagcagccgctgcaggaccggatgtttgaattt
 gaacttaccggccggtttggaccatgactttgggaagggtcaccaaacaggaagtaaggactttt
 tccggtgggtctccgatcagctgactgacgtggctcatgatgttctacgtcagaaaagggtggagc
 taagaaacgccccgcctccaatgacgcggatgttaagcgagccaaaacgggagtgacagtcactt
 gcgagccgacacagctcagacgcggaagcaccggcgagctacgcggacaggtacaaaaacaaat
 gttctcgtcacgtgggcatgaatctgatgcttttccctgttaaacaacatgcgagagaatgaatca
 aatttccaatgtctgttttacgcatggtcaaaagagactgtggggaatgcttccctgggaatgtca
 gaatctcaaccggttctgtcgtcaaaaagaagacttatcagaaactgtgtccaattcatcata
 tctctgggaagggcacccgagattgcctgttcggcctgcgatttggccaatgtggacttggatga
 ctgtgtttctgagcaataa

FIG. 10

MPGFYEIVIKVPSDLDEHLPGISDSFVSWVAEKEWELPPDSMDLNLIEQAPLTVAEKLQDFL
 VQWRRVSKAPEALFFVQFEKGESYFHLHLVETTGKMSVLGRFLSQIRDKLVQTIYRGIEPTL
 PNWFAVTKTRNGAGGNKVVDCEYIPNYLLPKTQPELQWANTNMEEYISACLNLAERKRLVAQH
 LTHVSQTOEQKNENLNENSDAPVIRSKTSARYMELVGWLVDGRITSEKQWIQEDQASYISFNAA
 SNRSQIKAALCGCKKIMALTKSAPDYLVGPAAPPADIKTNRIYLELNGYEPYAGSVFLGWA
 QKRFGKRNTIWLFGPATGKTNIAEALAHAVPFYGCYNWNTNENPFNDNCVDKMWIWNWEGKMTA
 KVVESAKAILGGSKVRVDQKCKSSAQIDTFPVIIVTNTNMCVIDGNSTTFEHOQLQDRMFKF
 ELTRLEHDFGKVTQKQEVKEFWAQQDHVTEVAHEFYVRKGGANKRPAAPPDDADKSEPKRACPSV
 ADPSTSAEAGAPVDFADRYQNKCSRHAGMLQMLFPCKTCERMNQNFNICFTHGTRDCSECFPGV
 SESQPVVRRKRTYRKLCAIHLLGRAPEIACSACDLVNVDLDCVSEQ

FIG. 11

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atgccgggcttctacgagatcgtgatcaagggtgccgagcgacctggacgagcacctgccgggca
 tttctgactcgtttgtgagctgggtggccgagagaaggatgggagctgcccccggtattctgacat
 ggatctgaatctgatctgacgagcgacccctgacccgtggccgagagactgcagcgcgacttctcg
 gtccaatggcgccgctgagtaaggccccggaggccctcttctttgttcagttcgagaagggcg
 agtcctacttccacctccatattctggtggagaccacgggggtcaaatccatggtgctgggccc
 ctctcgtgagtcagattagggacaagctgggtgcagaccatctaccggggatcgagccgacctg
 cccaactgggttgcgggtgaccgaagcgcgtaaatggcgccggagggggggaacaaaggtgggacg
 gctgctacatccccaaactacctctgcccaagactcagcccagctgcagctggctggatctgacg
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 ctgaccacgctcagccagaccaggagcagaacaaggagaattcgaacccaattctgacggc
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 catcacctccgagagaagcagtggtatccaggaggaccaggccctcgatcatctccttcaacggcgt
 tccaactcggctccagatcaaggccgctctggacaatgccgggcaagatcatggcgctgacca
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 acatccggaagccatcgcccacggcgtgcccctctacggctcgctcaactggaccaatgagaa
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 aaggctcgtggagtcggccaaggccattctcggcgggcagcaagggtgcgcgtggacaaaaagtga
 agtgcctccgacgatcgccccacccccgctgactcactccaacaccaacatgctgcggct
 gattgacgggaacagcaccaccttcgagcaccagcagccgttcgaggaccggatgctcaaat
 gaactcaccgcccgtctggagcatgactttggcaaggtgacaaggcagggaagtcaaaagattct
 tccgctgggcccaggatcacgtgaccgaggtggcgcatgagttctacgtcagaaaggtggagc
 caacaaaagacccgcccccgatgacgcggataaaaagcgagcccaagcgggctgcccctcagtc
 gcggatccatcgacgtcagacgcgggaaggagctccgggtggactttgccgacaggtacaaaaaca
 aatggttctcgtcacggcgctatgcttcagatgctgttccctgcaagacatcgagagaaatgaa
 tcagaatttcaacatttgcctcacggcacgggacgagagactgttcagagtcttcccgccgctg
 tcagaatctcaaccggctcgtcagaaaaggagcgtatcggaactctgtgccattcatcatctgc
 tggggcgggctcccgagattgctgtctcggcctgcgactctggtcaacgtggacctggatgactg
 tgtttctgagcaataa

FIG. 12

MPGFYEIVIKVPSDLDEHLPGISDSFVNWVAEKEWELPPDSMDLNLIEQAPLTVAEKLQRDL
 VQWRRVSKAPALFFVQFEKGESYFHLHLIVETTVKSMVLGRFLSQIRDLVQTIRYIEPTL
 PNWFVAVTKTRNGAGGGGNKVDECYIPNYLLPKTQPELQWAWNTMEEYISACLNLAEERKLVAHD
 LTHVSQTEQENKENLNPNSDAPVIRSKTSARYMELVGVWLVDRGISTSEKQWIEDQASYSFNAA
 SNRSRQIKAAALDNAGKIMALTKSAPDYLVGPPADIKTNRIYRILELNGYDPAYAGSVFLGWA
 QKRFGRKNTIWLFGPATTGKNTIAEAIAHAVFFYGCNVNTNENFFNDQVDKMWIWEEGKMTA
 KVVESAKAILGSGSKVRVDQKRSSAQIDPTFVIVTSNTNMCAVIDGNSTTFEHQQPLQDRMFKF
 ELTRSLDEHDFGKVTQEVKEFFRWAQDHVTEVAHEFFYVRKGGANKRPAPDDADKSEPRACPSV
 ADPSTSDAEGAPVDQADRVQNKCSRHAGMLQMLFPCKTCERMNQNFICFTHGTRDCSECFPGV
 SESQPVVRKRTYRKLCIAIHLLGRAPEIACSACDLVNVDLDDCVSEQ

FIG. 13

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atgcccggggttttacgagattgtgattaaaggtccccagcgaccttgacgagcatctgcccggca
 tttctgacagctttgtgaactgggtggccgagaaaggaattggaggttgccgccagattctgacat
 ggatctgaattgtattgagcaggcaacctgacccgtggccgagaaagctgagcgcgcaacttctgt
 gtcacagtgccgcgctgagtaagggccccggaggccctctcttcttctgatttcagttcgagaagggcg
 agtccctacttccactccatattctggtggagaccacgggggtcgaatccatgggtgctggggcg
 cttcctgagtcagatttagggacaagctgggtgcagaccatctaccgcggggtcgagccgacacctg
 cccaactgggttgcgggtgaccgaagacgcgtaatggcgccggagggggggaacaaaggtggtggacg
 agtgctacatccccaaactacctcctgcccgaagactcagcccagctgcagtgggcgctggactaa
 catggaggagtagtataaagccgctggttaaaccttgccgagcgcgaacacggctcgtggcgacgac
 ctgaaacacgtcagccagaccaggagcagaaacaggagaattctgaacccaattctgacgcgcg
 ctgtcatccggtcaaaaaacctccgcacgctacatggagctggtcgggtggtcgtggtggaccgggg
 catcacctccgagaagcagtggtacccaggaggaccaggccctcgatcatctccttcaacggccgcc
 tccaactcgggtcccagatcaaggccgctctggacaatgccggcaagatcatggcgctgacca
 aatccgcgcccagctacctggtaggccccgctccgcggccgcgacattaaacacacgcgattta
 ccgcatctctggagctgaacggctacgacctgctacgcggctccgctcttctcggctggggcc
 cagaaaaaggttcggaacacgcaacaccatctggctggtttggggccggccaccacggggcaagacca
 acatccgggaagccatgccccagccgctgccccttctacggctgcgtcaactggaccaatgagaa
 ctgtcccttcaacgatttgctcgacagaagatgggtgatctgtggggaggaggggcaagatgacggcc
 aaggtcgtggagtcgcgcaaggccatttctcggcgccagcaaggtgcgcgtggaccaaaagtga
 agtcgtccgcccagatcgatcccaacccccgtgatcgctcacctccaacacacacatgtgcgcgt
 gattgacgggcaacagcaccacaccttcagagcaccagcagccgttcaggagaccggatgttcaaattt
 gaactcaccggccctcgggacgatgactttggcaaggtgacaaagcagggaattcaagagttct
 tccgctggggcgcaggatcacgtgaccgaggtggcgcatgagttctacgtcagaaaggggtggagc
 caacaagagaccgcccccgatgacgcggataaaaagcgagcccaagcgggctgcccctcagtc
 ggggacatcgacgtcagacgcgggaaggagctccgggtggactttgccgacaggtacaaaaaca
 aatgttctcgtcaccgcccgcgtctcagatgctgtttccctgcaaaacatgcgagagaatgaa
 tcagaatttcaacatttgcttcacgcacgggaccagagactgttcagaatggttccccggcgctg
 tcagaattctcaacggctgcagaaagaggacgtatcggaactctggtgccattcatcatctgc
 tggggcgggctcccgagattgcttgcctcgccctgcgattggtcaacgtggatctggatgactg
 tgcttctgagaataa

FIG._ 14

MPGFYEIVIKVPSDLDEHLPGISDSFVNWVAEKEWELPPDSMDLNLIEQAPLTVAEKLQDRFL
 TEWRRVSKAPEALFFVQFEKESYFHMHLVETTVGVKSMVLGRFLSLQIREKLIQRIYRGIEPTL
 PNWFVAVTKTRNGAGGGNKVVDECYIPNYLLPKTQPELQNAWNTMEQYLSACLNLTERKRLVAQH
 LTHVSQTQEOKNENPNSDAPVIRSKTSARYMELVGLVDKGISETSEKQWITQEDQASYISFNAA
 SNSRSQIKAAALDNAGKIMSLTKTAPDYLVGQQPVEDISSNRIYKILELNGYDPPQYAAVSFLGWA
 TKKFGKRNITWLFGPATTKNTIAEALIAHTVPFYGCWNWNTNENFPFNDKVDKMWIWWEEGKMTA
 KVVESAKAILGGSKVRVDQCKKSSAQIDPTPVIVTSNTNMCVAVIDGNSTTFEHQQPLQDRMFKF
 ELTRRLDHDGFKVTKQEVKDFRWAKDHVVEVEHEFYVKKGGAKKRPAPSDADISEPKRVRESV
 AQPSTSDAEASINYADRLARGHSL

FIG._ 15

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atgccggggttttacgagattgtgattaagggtccccagcgaccttgacgagcatctgcccgga
 tttctgacagctttgtgaactgggtggccgagaaaggaatgggagttgccgccagattctgacat
 ggatctgaatctgatttgagcaggcacccctgaccgtggccgagaagctgcagcgcgactttctg
 acggaatggcccgctgtgagtaaggcccccggaggccctttctttgtgcaatttgagaagggag
 agagctacttccacatgcacgtgctgtggaaccacccgggtgaaatccatggttttgggacg
 tttctgagtcagattcgcgaaaaactgattcagagaatttaccggggatcgagccgactttg
 ccaactgggttcgggtgcacaaagaccagaaatggcgccggaggcggaacaaaggtgggtgag
 agtctacatccccaaattacttctccccaaaaccagcctgagctccagttgggctgggactaa
 tatggaacagtatattaagcgctgtttgaattctcagggagcgtaaaagggttgggtggcgagcat
 ctgacgcacgtgtcgagacgcaggagcagaacaaagagaatcagaatcccaattctgatgcgc
 cggtgatcagatcaaaaacttcgagccaggtacatggagctgggtcggttgcgtggacaaggg
 gattacctcggaagaagcagtggtaccaggaggaccaggccctcatatctcttcaatgcggcc
 tccaactcgcggtcccaaatcaaggctgccttggacaatggcggaagattatgagcctgacta
 aaccgcccccgactacctgggtgggcccagcagcccggtggaggacatttccagcaatcggatta
 taaaattttggaactaaacgggtacgatcccaaatatcgcgcttccgtcttcttgggagggcc
 acgaaaaagttcggcaagaggaaacaccatctggctgtttgggctgcgaactaccgggaagacca
 acatcgcgaggggccatagcccacactgtgcccttctacgggtgcgtaaactggaccaatggaa
 ctttcccttcaacgactgtgtcgacaagatggtgatctgggtggaggagggggaagatgacccg
 aaggctcgtggagtgcggccaaagccattctcgaggagaagcaaggtgcgcgtggaccagaaatgca
 agtcttcggcccgagatagaccgactcccggtgatcgtcacctccaacaccacatgctgcgcgt
 gattgacgggaactcaacgaccttcgaacaccagcagcgttgcgaagaccggatgcttcaaat
 gaactcaccgcccgtctggatcatgacttgggaaggtcaccacgggaagtcacgaacttctt
 tccggtgggcaaggatcacgtgggttgggtggagcatgaatttcacgtcaaaaaggggtggagc
 caagaaaagaccgccccagtgacgcagatataagtgagcccaacgggtgcgcgagtcagtt
 gcgcagccatcgacgtcagacgcggaagcttcgatcaactacgcagacagcttttgggggcaac
 ctgcgacgagc

FIG. 16

MPGFYEIVIKVPSDLGLHLPGISDSFVNWVAEKEWELPPDSMDMLNLIEQAPLTVAEKLQRDFL
 TEWRVSKAPEALFFVQFEKGESYFHHMVLVETTVGKSMVLGRFLSQIREKLIQRIYRGIPTL
 PNWFAVTKTRNGAGGNGKVDECYIPNYLLPKTQPELQWANTNMEQYLSACLNLTERKRLVAQH
 LTHVSQTQEQNKENQNPNSDAPVIRSKTSARYMELVGLVDKGITSEKQWLQEDQASYISFNAA
 SNRSRQIKAAALDNAGKIMSLTKTAPDYLVGQQPVEDISSNRIYKILELNGYDPPQYAAVSFLGWA
 TKKFGKRNITWLFGPATTTGKTNIAEAIAHTVFFYGCVNNTNENFPFNDVDMVWEEGKMTA
 KVVESAKALLGGSKVRVDQKCKSSAQIDPTPVIVTSNTNMCAVIDGNSTTFEHQQPLQDRMFKF
 ELTRRLDHDGFKVTKQEVKDFRWAQKDHVVVEHEFYVKKGGAKKRPAAPSDADISEPKRVRESV
 AQPSTSDAEASINYADRLARGHSL

FIG. 17

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atgcgggggttttacgagattgtgattaaaggtcccccagcgaccttgacgagcatctgcccgga
 tttctgcagcgttttgaactgggtggccgagaaaggaatgggagttgccgcgcagattctgcacat
 ggaatctgaatctgattgcgagcagccacctgacctggcgcgcgagcgaaagctgcagcgcaattctgc
 acggaatggcgccgtgtgattgaagccccggaggccctttctttgtgcaatttgagaaaggaag
 agagctacttccacatgcagctgctcgtggaaaccacccgggtgaaatccatggttttgggacg
 ttctctgagtcagattcgcgaaaaactgattcagagaatttaccgcgggtgcagcgcaattctg
 ccaaaactgggttcggcgttcacaaagaccagaaatggcgccgggagcggggaacaagggtgggtgag
 agtgcacatccccaattacttctcctcccaaaaccagcctgagctccagctggcgctggagactaa
 ctatggaacagctatttaagcgccgtgttgaattctcagcgagcgttaaacggcttggtggcgagcat
 ctgacgcagctgtcgcagacgcaggagcagaaacaagagaatcagaatcccaattctgtgacgcg
 cggtagtcagatcaaaaacttcagccaggtacatggagctgggtcgggtggctcgtggacaagggg
 gattacctcggagaagcagtggaatccaggagaccagcgctcatatctccttcaatgcggccc
 tccaactcggcgttcccaaatcaaggctgccttggacaatgcgggaaagattatgagcctgacta
 aaaccgccccgcgactacctgttggggccagcagcccggtggaggacatttccagcaatcggattta
 taaaattttggaactaaaagggttacgactcccaaatgcggcttccgctcttctgggagtgggcc
 acgaaaaagttcgggaagaggaacaccatctggctgttgggcttgcgaactaccgggaagacca
 acatcgcgggagggccatagcccaactgtgcctctctacgggttgcgttgaactggaccaatgagaa
 ctcttccctcaacgactgtgtcgacaagaatgggtgatctgggtgagggagggggaagcagtcggcc
 aaggctcgtggagtgcggcgaagccattctcgggaggaagcaaggctgcgcgtggaccagaaatgca
 agtccctcggccagatagaccggactccgctgatcgtcaactccaacacccaatgtgcgcgctg
 gattgacgggaactcaacgaccttcgaacaccagcagccggttgcagaacccggatgttcaaat
 gaaactcaccgcgctctggtatcatgactttgggaaggtccaagcagggaagtcaaaagactttt
 tcgggtgggcaaaaggtacagctgggtgaggtggagcatgcaattctcagtcacaaaagggtggagc
 caagaaaagacccgccccagtgacgcagataaagtgaagcccaaacgggtgcgcgagtcagtt
 gcgcagccatcgcagctcagacgcgggaagcttcgatcaactacgcagacagattggctcaggagc
 actctctctga

FIG. 18

MELVGLVLDKGITSEKQWIEDQASYISFNAAANSRSQIKALDNAGKIMSLTKTAPDYLVGQO
 PVEDISSNRIYKILELNGYDPQYAAVSFLGWATKKFKRNTIWLFGPATGKTINIAEIAHTVP
 FYGCVNWTNENFPFNDCCVDMKVIWWEKGKMTAKVVESAKAILGGSKVRVDQKCKSSAQIDTFV
 IVTSNTNMCAVIDGNSTTFEHQQLQDRMFKFELTRRLDHDGFKVTKQEVKDFRWAHDHVVEV
 EHEFYVKKGGAKKRPAPSDADISEPKRVRESVAQPSSTDAAESINYADRVQNKCSRHVGMMNML
 FPCRQCERMNQNSNICFTHGQKDCLECFPVSESQPVSVVKKYQKLCYIHIMGKVPDACTACD
 LVNVLDLDDCIFEQ

FIG. 19

atggagctgggtcgggtggctcgtggacaaggggattacctcggagaagcagtggaatccaggagg
 accagggcctcatatctctctcaatgcggcctccaaactcggcgtcccaaatcaaggctgcctt
 ggacaatgcgggaagattatgagcctgacataaaacgcgcccgactcagctgggtcggccagcag
 cccgtggaggacatttccagcaatcggatttataaaattttggaactaaaagggtacgatcccc
 aatatcgcggctccgctcttctcgggatggggccacgaaaaagtctcggcaagagaacaccatctg
 gctgttttgggctccgaactaccgggaagacccaactcgcggaggccatagcccacactgtgcoc
 ttctacgggtgcgttgaactggacccaatgagaactttcccttcaacgactgtgtcgacaagatgg
 tgatctgggtggaggagggggaagatgacccccaaggtcgtggatcggcgaagcattctcgg
 aggaagcaaggtgcgcgtggaccagaaatgcaagtcctcggccagatagaccgcgactcccggtg
 atcgtcacctccaacacccaatgtgcgcgctgattgacgggaaactcaacgaccttcgaacacc
 agcagcgtgtgcaagacggatgttcaaatttgaactaccgcgcgcttggtatcatgactttgg
 gaaggtcaccagacagggaagtcaaaagacttttccgggtgggcaaaaggtacagctgggtgaggtg
 gagcatgaattctcagcttcaaaagggtggagccaagaaaagcccccagctgacgcagata
 taagtgaagcccaaacgggtgcgcgagtcagttgcgcagccatcgagctcagacgcgggaagctt
 gatcaactacgcagacaggtacaaaacaaatgtctcgtcagctgggcatgaatctgatgcgt
 ttccctgcagacaatgcgagagaatgaatcagaattcaaatatctgcttcaactcacggagaca
 aagactgtttagagtgcttcccggtgcagaattcaccacggtttctcgtcgaataaaggcgta
 tcagaactgtgtcactatcatcatatcaggggaaggtgcagacgcttgacgctcgtcgtgcat
 ctgggtcaatgtggatttggatgactgcacatttgaacaataa

FIG. 20

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MATFYEVIVRVPFDVEEHLPGISDSFVDWVTGQIWELPPESDLNLTIVEQPQLTVADRIRRVFL
 YEWNKFSKQESKFFVQFEKGSYFHLTLVETSGISSMVLGRYVSQIRAOVLKVVFFQIEPQIN
 DWVAITVKKGGANKVVDSSGYIPAYLLPKVQPELQWANTNLDEYKLAALNLEERKRLVAQFLAE
 SSQRSQEAASQREFSADPVIKSKTSQKYMALVNWLVHEGHTISEKQWIQENQESYLSFNSTGNSR
 SQIKAALDNATKIMSLTKSAVDYLVGSSVPEDISKNRWQIFEMNGYDPAAYAGSILYGCWQSRF
 NKRNVTVLYGGPATCTKNTNIAEAIAHTVPFYGCNVNWTNENFPNDCCVDKMLIWWEEGKMTNKVVE
 SAKAILGSKSVRVDDCKKSSVQIDSTPVIIVTSNTNMCVVVDGNSSTTFEHQQLPLEDRMFKFETK
 RLPPDFGKITQEVKDDFFAWAKVNVQVPTHEFKVRELAGTGKAEKSLKRLGVDVNTNTSYKSL
 KRARLSFVPETPRSSDVTVDPAFLRPLNWNNSRYDCKCYDHAQFDNISNKCDECEYLNRGKNGCI
 CHNVTHCQICHGIPPEKENLSDFGDFDANKEQ

FIG._21

atggctacaccttctatgaagtcattgttgcgctcccaatttgacgtggaggaacatctgcctggaa
 ttcttcacagcttttggactgggttaactgggtcaaatttgggagctgcctccagagtcagattt
 aaatttgactctggttgaacagcctcagttgacggtggtctgatagaattcgccgctgttctctg
 tacagatggaaacaaattttccaagcaggagtcctcaaatctcttctgtgcagtttgaagaaggatctg
 aatattttcatctgcacacgcttgtggagacctccggcatctcttccatgggtcctcgccgctta
 cgtgagtcagattcgcccccagctggtgaaagtgggtcttccagggaattgaaccccagatcaac
 gactgggtcgcccatcaccaaggtaaaagaaggcgaggccaataaaggtgggtgattctgggtata
 ttcccgctacgtgctgccgaaggtccaacccggagcttcagtggtgggtgggacaaacctggacga
 gtataaatggccgctctgaattctggaggagcgcaaacgggtctgcgcgagtttctggcagaa
 tctctgcagcgtctgcaggaggcggtctgcgcggtgagttctcggtgacctgggtcatcaaaa
 gcaagacttcccagaataacatggcgctcgtaactgggtcggtggagcaccggcatcacttccga
 gaagcagtggtccaggaaaatcaggagagctacctctcttcaactccacccggcaactctcgg
 agccagatcaaggccgctcgacacccgacccaaaattatgagtcgacaaaaagcgcggtgg
 actacctcggtggggagctcggttcccgaggacatttcaaaaaacagaatctggcgaatttttga
 gatgaatgggtacgacccggctctacgaggatccatctctacgggtggtgctcagcgtctcttcc
 aacaaaggaagaacacgctctgggtctacgggacccgcccagcaggcaagacacatcgcgagg
 ccatcgccacactgtgaccttttacggctgcgtgaaactggacccaatgaaaacttccctttaa
 tgactgtgtggacaaaatgctcatttgggtgggaggagggaaaagatgaccaacaaaggtgttga
 tcccgcaaggccatctctggggggtctcaaaggtgcggtcgatcagaatactgtaactctgttct
 aaattgattctaccctgtcattgttaacttccaatacaaacatgtgtgtggtggtggatgggaa
 ttccacgacctttgaacaccgacgagcgtggaggacgctgtaaaattgaaactgactaag
 cggtctccgcgagatttttggcaagattactaagcaggaaagtcagggaacttttctgctgggcaa
 aggtcaatcaggtgcccgtgactcacgagtttaaagttccccaggaaattggccgggaactaaagg
 ggccggagaaatctctaaaaacccactgggtgagctaccacactagctataaaaagtctggag
 aagcggggcagggctcatttgttcccgagacgctcgagttcagacgtgactgttgatccgc
 ctctctcgacgcgtcaattgggaattcaagggtatgattgcaaatgtgactatcatgctcaatt
 tgacaacatttctaacaaatgtgatgaatgtgaatatttgaactcggggcaaaaatggatgtatc
 tgtcaaatgttaactcaactgtcaaatttgtcatgggattccccctgggaaaaggaaaacttgt
 cagattttggggatttttgacgatgccaaataaagaacagtaa

FIG._22

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MELVGLWLDKGITSEKQWQEDQASYISFNAAASNSRSQIKAALDNAGKIMSLTKTAPDYLVGQO
PVEDISSNRIYKILELNGYDPPQYAA SVFLGWATKKFGRNRTIWLFGPATGKTNIAEAIHAHTVP
FYGCVNWTNENFPFNDQVDMVIWWEKGMTAKVVESAKAILGGSKVRVDQKCKSSAQIDPTPV
IVTSNTNMCAVIDGNSTTFEHQQPLQDRMFKFELTRRLDHDHFGKVTKQEVKDFFRWAKDHVVEV
EHEFYVKKGGAKKRPAPSDADISEPKRVRESVAQFSTSDAEASINYADRLARGHSL

FIG._23

atggagctggtcggtggtgctcgtggacaaggggattacctcgggagaagcagtggtaccaggagg
accaggcctcatcacatctccttcaatgcggcctccaactcgcggtcccaaatcaaggctgcctt
fygcaatgcgggaaagattatgagcctgactaaaaccgcccccgactacctggtgggcccagcag
cccggtggaggacatttccagcaatcggatttataaaattttggaaactaaacgggtacgatcccc
aatatgcggccttcggtctttctgggatgggcccacgaaaaagttcggcaagagggaacaccatctg
gctgtttgggctgcaactaccgggaagaccaacatcgcgaggccatagcccacactgtgccc
ttctacgggtgcgtaaactggaccaatgagaactttcccttcaacgactgtgtgcagaagatgg
tgatctgtgtgggaggagggggaagatgaccgccaaaggtcgtggagtcggccaaaagccattctcgg
aggaagcaaggtgcgctggaccagaaatgcaagtcctcggcccagatagaccgcactcccggtg
atcgctacctccaacaccaaactgtgcgcggtgattgacgggaactcaacgaccttcgaacacc
agcagccggttgaagaccggatgttcaaatttgaactcaccgcgctctggatcatgactttgg
gaaggtcaccagcaggaagtcaaagacttttccgggtgggcaaggatcacgtggttgagggtg
gagcatgaattctacgtcaaaaagggtggagccaagaaaagaccgcccccagtcgacgcagata
taagtgagcccaacgggtgcgcgagtcagttgcgcagccatcgacgctcagacgcgggaagcttc
gatcaactacgcagacagcttttgggggcaacctcggacgagc

FIG._24

MAFSRPLQISSDKFYEVILRLPSDIDQDVPGLSLNFVEWLSGTGVWEPTGIWNMEHVNLPMVTLA
DKIKNIFIQRWNQFNQDETDFFQLEEGSEYIHLHCCIAQGNVRSFVLGRYMSQIKDSILRDVY
EGKQVKIPDWFSTITKTKRGQNKTVTAAYILHYLIPKKQPELQWAFTNMPLFTAALCLQKRQE
LLDAFQSESMNAVVEDQASTAAPLISNRAKNYSNLVDWLIEMGITSEKQWLTKENKESYRSFO
ATSSNNRQVKAALENARAEMLLTKTATDYLIGKDPVLDITKNRIYQILKLNNNYPQYVGSVLCG
WVKREFNRKNAIWLPGPATGKTNIAEALAHAVPFYGCNVNWTNENFPFNDQVDMKLIWWEKGMT
TNKVVESAKAILGGSAAVRVDQKCKGVSVCIEPTPVIITSNTDMCMIVDGNSTTMEHRIPLERMF
QIVLSHLEGNFGKISKKEVKEFFKWANDNLVPVVSSEFKVPTNEQTKLTEPVPERANEPSEPPK
IWAPPTREELEEILRASPELFAVAPLPSPDTSFKRKKTREYQVRCAMHSLDNSMNVFECL
CERANFPFQSLGENFCNQHGWDCAFCNELKDDMNEIEHVFAIDDMENEQ

FIG._25

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atggcattttctaggcctcttcagatttcttctgacaaattctatgaagtatcatcaggctac
 cctcggatattgatcaagatgtgcctgggtttgtctcttaactttgtagaaatgggttcttaccggg
 ggctcgggagccacccggaatatggaatatggagcatgtgaatctcccaggtcttactctggca
 gacaaatcaagaacattttcatccagagatggaaccaattcaatcaggacgaaacgggatttct
 tctttcaattggaagaaggcagtgagtacatccatctgcattgctgtattgcccagggggaatgt
 ccgatcttttgttctggggagatacatgtctcaaataaagactcaattctgagagatgtgtat
 gaagggaaacaggtaaaaatcccggatgggttttctataactaaaaaccaacggggaggggcaaa
 ataagacogtgcagtgctgtcttattctgcattacctgattctcaaaaaaccaacgggaattaca
 atgggcttttaccaatatgcccttttctactgctgctgtcttattgctctcaaaaagggcaagag
 ttactggatgcttttcaggaaagtgcagatgaatgctgtagtgcaggaggatcaagcttcaactg
 cagctcccccttatttccaacagagcagcaaaagaactatagcaatctgggtgattggctcattga
 gatgggtatcacctctgaaaaacagtggtctaaactgaaaataaagagagctaccggagctttcag
 gctacatcttcaacaacagacagaagtaaaagcagcacttgaaaatgcccagcagaaaatgctac
 taacaaaaactgccacagactatttgattggaaaagaccaggttctggacattcaaaaaatcg
 gatctatacaaatctgaagttgaataactataaccctcaatgatggggagcgtctactcggga
 tgggtgaaaagagaattcaacaaaagaaatgccatattggctctacggacgtcgaccaccggaa
 agaccaacatagccgaggtctattggccatgctgtacccttctattggctgtgttaactggactaa
 tgagaacttcccatttatagactgcgttgataaaatgcttataatgggtgggaggagggaaaaatg
 accaataaagtctgtgaatccgcgaaagcgatactgggggggtctgctgtacgagttgatcaaa
 agtgtaaggggtctgtttgtattggaacctactcctgtaataataccagtaatactgatgtgt
 catgattgtggatggaatcttactacaatggaacacagaattcctttggaggaaagaatgttc
 cagattgtctttcccataagctggaaggaaaatttggaaaaatttcaaaaaaggagggtaaaag
 agtttttcaaatgggccaatgataatctgttccagtagttctgagttcaaaagtccctacgaa
 tgaacaaaccaaacttactgagcccggttcttgaacgagcgaatgagccttccgagcctcctaa
 atatgggtctccacctactaggaggagctagaggagatattaagagcgcgcccgtgagctctttg
 cttcagttgctcctctgcttccagtcgggacacatctcctaaagagaaagaaaaccggtgggga
 gtatcaggtacgctgtgctatgcacagtttagataactctgaatgtttttgaatgctcggag
 tgtgaaagagctaattttccgtaattccagagttcgggtgaaacttttgatcaaacatgggt
 ggtatgatgtgcattctgtaatgaactgaaagatgacatgaatgaaatgaaactgtttttgc
 tattgatgatgagggaatgaacataa

FIG._26

MALSRPLQISSDKFYEVIIIRLSSDIDQDVPLSLNFEWLSTGVWEPTGIWNMEHVNLPMVTLA
 EKKNIFIQRWQNFQDETFDFQLEEGSEYIHLHCCIAQGNVRSFVLGRYMSQIKDSIIRVY
 EGKQIKIPDFAITKTKRGGQNKVTVAAYILHYLIPKKQPELQWAFNMPLFTAALCLQKRQE
 LLDAFQSSDLAFLPDPQASTVAPLISNRAAKNYSNLVDWLEMGITSEKQWLTFENRESYRSFQ
 ATSSNNQVKAALENARAEMLLTKTATDYLIGKDPVLDTIKNRVYQILKMNYNYPQYTGSI LCG
 WVKREFNKRNAIWLGPATTKTNIAEALAHAVPFYGCNVNWTNENFFNDCCVDKMLIWWEEGKM
 TNKVVESAAILGGSAVRVDQCKGSCIEPTPVIITSNITDMCMIVDGNSTMEHRNIPLEERM
 QIVLSHLEPSFGKISKKEVREFFKWANDLNPVVSFVKVRNEQNLPEFVPPERANEPPEEPFK
 IWAPPTREELEELLRASPELFSVAPIPVTPQNSPEPKRSRNNYQVRICALHTYDNSMDVFECME
 CEKANFPEFQPLGENYCDHEGWYDCAICKELKNELAEIEHVFELEDAENEQ

FIG._27

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atggcactttctaggcctcttcagattttctctgataaattctatgaagttattattagattat
catcggaattatgatacaagatgtcccggtctgtctcttaactttgttagaatggctttctaccgga
agtttgggagcccaaggatctcggaacatggagcatgtgaattctaccgatgggtgaccttggca
gagaagatcaagaacattttcatacaagaatggaatcagttccaaccaggacgaaacgggaacttct
tctttcaactggaagaaggcagtgagtagattcatcttctcattgtgtgtattgcccaggggcaatgt
acgggtcttttgttctcgggagatatagtgtccagataaaaagactctatcataagagatgtatat
gaaggggaaacaaatcaagatccccgatctggtttgtctattactaaaaccaagagggggaggacaga
ataagaccgtgactgcagcatacatactgcatctacattcttcttaaaaagcaacctgaactgca
atgggctcttaccatattgcctttattcactgctgctgctcttctgtctgcgaaaagcggcaagaa
ttgctggatgcatttcaagaagtgatttggctgccccctttacctgtctccaagcatcaactg
tggccagcgttattttccaacagagcgggcaaaagaactatagcaaccttgttgattgggtcattga
aatggggataaacattctgagaagcaatggctcactgagaaccgagagagctacagaagctttcaa
gcaactcttccaataatagacaagtgaagctgcaactggaaaatgcccggtgctgaaatgttat
tgacaaagactgcaactgattacctgatagggaaaagaccctgtcctggatataaactaagaatag
ggctctatcaaatcttgaaaatgaataactacaaccctcaatacataggaagtattcctgtgcggc
tgggtgaagagagagtttcaacaaaagaaacgccaataggtctctacggacctgccaccacggga
agaccaacattgcagaagctattgcccattgctgtaccttctatggctgtgttaactgggactaa
tgagaactttccttttaattgattgtgttgataaaaatgctgatttgggtgggaggagggaaaatg
actaataaggttgttgaaatctgcgaaaagcaattttgggagggtctgctgtcgggtagaccaga
aatgtaagagatctgtttgttatgaaactactcctgttaattattactaatgactgatatgtg
tatgattgttgatggcaactctactacaatggaacatagaataccattagaggagcgtatgttt
caaatgtcctcatcacataaattggagccttctttggaaaatttctaaaaaagaagctcagag
aatttttcaaatgggccaattgacaactctagttcctgtgtgtgtgttcaaaagtccgaactaa
tgaacaaaccaacttgccagagcccggttcttgaaacgagcgaacgagccggaggagcctcctaa
atctgggctcctcctactagggaggaggttagaagagcttttaagagccagcccgagaattgttct
catcagtcgctccaattcctgtgactcctcagaactccctgagcctaagagaagcaggaaacaa
ttaccaggtagcgtcgcttttgatacttatgacaattctatggatgtatttgaatgtatggaa
tgtgagaagcaaaccttctgtaattcaacctctgggagaaaattattgtgatgaacatgggt
ggtatgattgtgctatatgtaaagagttgaaaaatgaacttgagaaattgagcatgtgtttga
gcttgatgctgtgaaaatgacaataa

FIG._28

MAFSRPLQISSDKFYEVIIIRLPSDIDQDVPGLSLNFVEWLSTGVWEPTGIWNMEHVNLPMTLA
DKIKNIFIQRWNQFNQDETDFFQLEEGSEYIHLHAVCPGECRSFVLGRYSQIKDSILRDVYE
GQVKIPDWFSITKTRGGQNKVTAAAYILHYLIPKKQPELQWAFNTMPLFTAALCLQRQEL
LDAFQESEMNAVQEDQASTAAPLISNRAAKNYSNLVDWLIENGITSEKQWLNTENKESYRSFQA
TSSNNRQKAALENARAEMLLTKTATDYLIGKDPVLDITKNR.YQILKLNNYNPQYVGSVLGAW
VKREFNKRNATWLYGPATVTKTNIAEALAHAVPFYGCNVWNTNENFPFNDVCYDKMLIWEEGKMT
NKVVESAKAILGGSVAVRVQDKCKGQSVCIETPVIIITSNTDMCMIVDGNSTMEHRIPLERMFQ
IVLSHKLEGNFGKISKKEVKEFFKWANDNLVPVVSEFKVPTNEQTKLITPVPERANEPSEPPKI
WAPPTREELEEILLRASPELFASVAPLPSSPDTSPKRKKTARGEYQVRCAHMSLDNSMNVFECLEC
ERANFPFQSLGENFCNQHGWDYDCAFNCNELKDDMNEIEHVFAIDDMENEQ

FIG._29

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atggcattttcttaggcctcttcagatttcttctgacaaattctatgaagtatcatcaggctac
cctcggatattgatcaagattgtcctgggtttgtctcttaacattttagaagtggtcttctacggg
ggctcgggagccaccgggaattggaatatggagcatgtgaattctcccatggttactctggca
gacaaaatcaagaacattttcatccagagatggaaccaattcaatcaggacgaaacgggatttct
tctttcaattggaagaaggcagtgagtacatccatctgcatgctgtatgccagggggaatgtcg
atcttttggttctggggagatacatgtctcaaattaaagactcaattctgagagatgtgtatgaa
gggaaacagggtaaaaatcccggttgggtttctataactaaaaacacggggaggggcaaaaa
agaccgtgactgtgcttatattctgctattacctgattctctaaaaacacacgggaattacaatg
ggcttttaccaatatgcccttttctactgctgctgctttatgcctccaaaagggcaagagtta
ctggatgcttttcaggaaagttagatgaatgtctgttagtgaggaggatcaagcttcaactgcag
ctccccctattttccacagagcagcaaaagaactatagcaattctggttgattggctcattgagat
gggtatcacctctgaaaaacagtggttaactgaaaataaagagagctacccggagctttcaggct
acatcttcaaacacagacaaggtaaaagcagcacttgaaaatgccgagcagaatgtctactaa
caaaaactgccacagactaattgattggaagacccagttctggacattactaaaaatcggat
ctatcaaatctctgaaattgaaataactataaccctcaatattgtagggagcgtcctatgcggatgg
gtgaaaagagaattcaacaaaaagaaatgccatatgggtctacggacctgcgaccacgggaaga
ccaacatagccggaggctattgcccattgctgtacacctctctatggctgtgttaactggactaatga
gaactctccatttaaatgactgcgttgataaaaatgcttatatgggtgggaggagggaataatgacc
aataaagttagtggaatccgcaaaagcgatactgggggggtctgctgtacagattgtatcaaaagt
gtaaggggtctggtttgtattgaacctactctctgtaataattaccagtaatactgatatgtgcat
gatttgggatggaaattctactacaatggaacacagaattcctttggaggaaaagaatgttccag
attgttctttccataagctggaaggaaattttggaaaaatttcaaaaaaggagggtaaaagagt
ttttcaaatggggccaatgataatcttgttccagtagtttctgagttcaaatgcctacgaatga
acaacacaaacttactgagccggttctctgaacgagcgaatgagccttccgagcctcctaagata
tgggtctccacctactaggaggagctagaggagatattaagagcgagccctgagctcttggct
cagttgctctctgctctccagctcgggacacatctcctaagagaaagaaaacccgtggggagta
tcaggtagcgtgctgtctatgcaggttagataactctatgaatggttttgaatcactggaggtg
gaaagagctaaattttctgaatttcagagctcgggtgaaaaacttttgtaatcaacatgggtggt
atgattgtgcatctctgtaatgaactgaaagatgacatgaattgaaattgaacatgttttctgcat
tgatgatattggagaatgaacaataa

FIG._30

RPELQWAFNTMPLFTAALCLQKRQELLDAFQESDLAAPLPDPQASTVAPLISNRAAKNYSNLV
DWLIEMGITSEKQWLNTENRESYRSFQATSSNNRQVKALENARAEMLLTKTATDYILIGKDPVLD
ITKNRVYQILKMNNYNPQYIGSILCGWVKREFFNRKRNIAIWLGPATTGKNTNIAEALAHAVPFYGC
VNWNTNENFPFNDQVDKMLIWEWEGKMTNKNVVESSAKAILGGSASVRVDQKCKGVSVCIEPTPVIITS
NTDMCHIVDGNSTTMEHRIPLERMFQIVLSHKLEPSFGKISKKEVREFFKWANDNLVPVVSLEK
KVRTNEQTNLPEPVERANEPEEPPKIWAPPTREELELLRASPELFSVAPIPVTPQNSPEPK
RSRNNYQVRCALHTYDNSMDVFECECEKANFPEFQPLGENYCDERHGWYDCAICKELKNELEAI
EHVFELDDAENEQ

FIG._31

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cgacctgaactgcagtgggccctttaccaatatgcctttatttactgctgctgctcctttgtctgc
 aaaagcgggcaagaatttgctggatgcatttccaagagagtgatttgggtgccccctttacctgatcc
 tcaagcatcaactgtggcaccgcttatttccaacagagcggcaaaagaactatagcaacctgtt
 gattggcctcattgaaatgggcataaacatctgagaagcaatggctcactgagaaccgagagagct
 acagaagctttcaagcaactcttccaataatagacaagtgaaagctgcaactggagaatgccg
 tgcgtgaatgctattaacaaagactgcaactgattacctgataggaaaagacctgtctggat
 ataactaagaacaggggtctatcaaatcttgaataatgaataactacaacctcaatcataggaag
 gtatcctgtgcggctgggtgaagagagaggtccaacaaagaacacgcatatggctctacggacc
 tgcaccaccggggaagcacaacattgcagaagctattgccatgctgtacccctctatggctgc
 gttactggactaatgagaactttccttttaattgattgtgtgataagatgctgatttgggtggg
 agggaggaaaaatgactaataaggtgttgaatctgcaaaagcaattttgggagggtctgctgt
 ccgggtagaccagaaatgtaaaggatctgtttgtattgaacctactcctgtaattattaccagt
 aatactgatattgtgtatgattgttgatggcaactctactacaactggaacatagaataaccattag
 aggagcgcatgtttcaaatgtcctatcacataaattggagccttcttccgaaaaatatctaa
 aaaggaagtcagagaatttttcaaatgggccaacgacaatttagttcctgttgtgtctgagctc
 aaagtccgaacgaatgaacaaacaaacttgccagagcccggttccctgaacgagcgaacgagccag
 agggagcctcctaaaaatctgggctcctcctactagggaggaggttagaagagcttttaagagccag
 ccagaaattgttctcatcagttgtcctcaattcctgtgactcctcagaactccctgagcctaaag
 agaagcaggaacaattaccaggtagcgtgtgctttgcatacttatgacaattctatggatgtct
 ttgaatgtatggaatgtgagaaggcaaattttccctgaatttcaacctctgggagaaaaattattg
 tgatgaacatgggtgggtatgattgtgctatatgtaaagaattgaaaaatgaactgcagaaatt
 gagcatgtgtttgagcttgatgatgctgaaatgaacataa

FIG._32

MAQACLSLSWADCFAAVIKLPCLLEVLNSQFWQYVVLCKDPLDWPALQVTELAHGWVEVGAYC
 AFADALYLYLVGRLADEFSAIYLFFQLEPGVENPHIHVVAQATQLSAFNNRRILITQACHDMALG
 FLKPDYLGWAKNCVNIIKKDKSGRILRSDWQFVETYLKPKVPLSKVWYAWTNKPEFEPIALSAAA
 RDRLMRGNALCNQPGPGPSFGDRAEIQGPPIKKTKASDEFYTLCHWLAQEGILTEPAWRQRDL
 GYVRMHTSTQGRQVVSALAMAKNIILDSIPNSVFATKAENVTELFCFESNRCVRLRLTQGYDFV
 QFGCWVLRWLDRKTGKKNITWIFYGVATTGKTNLANATAHSLPCYGCNVNWTNENFPNDAPDKCV
 LFWDEGRVTAIKIVESVKAVLGGQDIRVDQKCKGSSFLRATPVIIITNSCKDMTVVRDGNNTTFAHR
 PAFKDRMVRMLNFDVRLPNDFGLITPTEVREWLRYCKEQGDDYEFPDQMYQFPDRVVSVPAPAL
 PQPGPVTNAPEEEILDLLTQTNFVTQPLSIEPAVGPEEEDVDADLGGSPAPAVSSSTESSADE
 DEDDDTSSSGDHRGGGGVMDLHASSSSFFTSSDSGLPTSVNTSDTPFSPVPVHHGPPTL
 LPTSRPTRDLAGRFSFRQYEPLKGRCADSTTFGRPSWAAPCAVYNTAELTRRGAGVRVVKGRS
 PGAISGR

FIG._33

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atggctcaagcttgctcttctctgtcttgggcagattgctttgccgctgtcattaagttgccat
gtccctcgaagaggtgtctgagcaacagccagttttggcgaactactatgtctctctgtaagaatcc
gttgactggccggccttacaggtcactgagctggctcatggttgggaggtgggtgcgtactgt
gcgtttgtcgtatgctttgtattttgtacctgggtgggcagactagcagacgagttttagtgctcat
tgctgtctttcaactagaacagggtgtggaaaatccccatatccatgttctgtggcaccagccac
ccagttgtcggcatttaactggcgctgcgcat ttaactcaggcatgtcatgacatggctctgggg
ttttgaaacctgactacttggcgctgggctaaaaattgtgtgaatattaaaaagacaggtctg
gacgaactttacggtcagactggcaattttgtagaaactaacctattgctcctaaaagttccoctgag
taaggtctggtatgcctggactaacagcccgaaatttgagcccatagctctcagtgccgctgcg
cgggacaggtgatgagaggcaacgcactttgtaacagccgggacgggcccgtcttttggag
accgggcagaaattcaggggacctcccatataaaagactaaggccatcagatgagttttacactct
ctgtcactgggttagctcaaggaggaatattaacagagccgtgctgggagacagagagatttagat
ggctatgtgcgtatgcacacctctactcagggggagcaggtggtgtctgtctcttggccatgg
ccaaaaactcatatattgtagcattccaaactctgtgtttgccacaaaggcagaagtgggtcac
agaactctgttttgaagtaaccgcgtgtgtgaggctcttgagaacacagggctatgacccgta
caatttggctgttgggtgttacgggtggctggaccgtataaacgggcaaaaaaatactatttgggt
tttatgggtgcgtactactgggaaaaactaatctagcaaatcgattgcccactacttccatg
ttatggctgtgtaaactggaccaatgaaaacttcccccttaatgacgcccccgacaaatgtgta
ttgttttgggacaggggttagatcagccgcaaaaattgtggaagtgttaagctgtgttgggag
gccaagactcagatgaggtcagaagtgttaaggggagctcttcttaaggctaccocagctcat
tatacaagttaatggggacatgaccgtttgtgcgagatgggaatacacacaacctctcgccatcgc
cctgcctttaaggacgcagctgttcgcttaattttgtatggagctcccaaatgactttgggg
ttatcacccccactgaggttcgcgagtggtgtgagatctgcaaggaaacaaggggacgattatga
gttccagaccagatgtaccagtttccacgagatgtgtttctgttctctctctcgtctcttgc
cctcagccaggggcagtcacaaatgccccggaagaagagatccttgatctccttaccocaaacaa
acttctcactcaacctgggctctctattgagccggccgcttggacctgaagaagaacctgatgt
cgagatcttggagggtctccagcaccagcagtcagcagcaccacagagctcagctgcgcagag
gacgaggacgcagcactcctcctcctctgcccagccacagagaggaggaggagggtcatgggag
atttacacgctctctctcctcctcttcttacttccagtgactcaggactccccacttccgtcaa
caccagcgacaccccttctcctctcagcccccgtaccagtgccaccaccacggacccccacgctt
ctccccacctcacgcccgcacagcgatctggcccggtggggcgccgctcttctccgcatgacgagc
catgaaaggccggtgtgcggactcgactacgtttgtgctgcgctcttggcgcccgctgtgc
agctcacaaactgcggagctgactcgtcgtggagcaggtgtccgagttgtgaagggtgcaaga
ccaggtgcgactctctggaaagtga

FIG._34

MEMFRGVVHVSANFINFVNDNWWCCFYQLEDDWPRLQGWERLIAHLIVKVAGEFAVPVGGSTLG
LQVFLQAEHNFDEGFHVHVVGFPVTPRNVCNIVETGFNVLRELTEPTYEVSFKPAISKKG
KYARDGFDFVTNYLMPKLPYNVSVTNFSEYEVVNCNSLAYRRNMHKKALTNTADEGEGSTNS
EWGPEPKKQKGTGVRGEKRVSLVDSLIERGIFTENKWKQVDWLKEYACLSGSVAGVHQIKTALT
LAISKNSPEYLCELLTRPSTINFNIKENRICKIFLQNDYDPLVAGKVFLAWLGLKELGRNRTIW
LFGPPTTGKTNIAMSLATAVPSYGMVWNWNENFPFNDVPHKSIILWDEGLIKSTVVEAAKAILG
GQCRVDQKNKGSVEVQGTFPVLTISNNDMTRVVSGNTVTLLIQRALKDRMVEFDLTVRCSNALG
LIPAECECKQWLFWSGHTPCDVFSSRWKEVCFVANKSDRDTGICYDFSENEIDLPGTQTPLLNSPVT
SKTSALKKTTIAALATAAVGTLTQSLTNNNWESSEDSGSPPRSSTPLASPERGEVFPQQQWELNTR
SVNSNNDNWPMTYTDWWVSKAQRPVCCLEHDTESVHCSLCLSEVLVPLMIENSINQPDVIR
CSHAECTNPFDVLTCKKCRELSALWSFVKYD

FIG._35

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atggaaatgtttcgggggtgtgtacatgtttctgctaactttattaactttgttaacgataaatt
 ggtgggtgttttttaccaggttagaggaagatgactggcgcgggtgcgaaggctgggaaagact
 tatagctcaacttaattgttaaagttagcaggagaatttctgtgttccgggagcgactcttaggg
 ctgcaatattttttacaagctgaacataaacacatttgatgaggggatttcatgtgcatgtagtag
 ttgtggggaccggtttgttactccagggaatgtgtgtaatatgttagaacaacaggccttaacaaagt
 tttaggggaacttacagagcctacttatgaggtgtcttttaagcctgccatttctaagaaagga
 aagtatgctagatagtgatttgactttgttaacaaactattttaatgccaaaactgtatcctaagt
 ttgtttactctgtttacaaatttttcagagtatgagtgtatgtaattcttttagcttacagaag
 gaacatgcataaaaaagccttttaacaaatactgcagatgaaggtgagggcaccagtagcaaaattca
 gagtggggaccagaacccaaaaaacagaaaactggtagcgtgaggagaaaagtttgttagtt
 tgggtgactcttttaatagagcgtggcatatttacagaaaacaaagtggaagcaggtagatggct
 taagaggtatgcctgtctcagtggaagtgtagcaggagtgaccagatataaacacagctttaact
 ttactattttctaaatgtaattctccagaataatttgtgtgtaattgttaactagaccagtagta
 ttaatttttaacatcaaagaaaaacagaatttgaagataattttacagaatgattatgatcctct
 gtatgctggtaaagtttttttagcttggcttggtaaagagttgggaaagcgtaataccatttgg
 ctttttggaccgctactactgtgttaaaacaaatatagctatgagtccttgccactgcagtaccga
 gttatggtatggttaattggaataatgaaaactttccttttaacgatgtgcccgcataaatctat
 tatttttgggttaggggaacttataaaagtactgttgggaagccgcaaaagccatttttagga
 gggcaaaatttcagagatggtatcaaaaaaataggggcagtgagaagttcaggggcaactcccgctc
 tgatcactagcaacaatgacatgactcgcgtgggtcaggcaacactgttacgcttatccatca
 gagggcgctaaagatcgatggttgagtttgacttgactgtgagatgctctaattgccccttgga
 ttaattcccgctgaggaatgtaagcagttggttcttggtcacagcataactccttgtgatgttt
 tctcaaggtggaaggaagtcgtgagtttgttggcttggaaaagtgcagaaacagggatttgcga
 tgactctcagaaaaacgaagatcttcgggggactcagaccctctgctgaacagcccagtgacc
 tcgaagacatcagcattgaagaaaaacgatagcggcattagcaactgcagcgggttggaaactac
 agacctcctcacaacaacaactgggagtcctctgaggatagcgggttccccgccccgcagcag
 caccocacttgcatctcctgagcggaggcgaagttccccccggcagcagtggaactgaacacc
 tcagtaaaactctgtaaatgctttaaactggcctatgtatacagtgagtggttgggtttggggatcta
 aggtccaaagacactgtgtgttgccttagagcatgatacagaaagttcagtgcatgttttcttgg
 ttaagttttagaggtgtgtgcctatgttaattgaaaacagattataaccagcccagtgtaattagg
 tgcctctgctcatgctgagtgactaatccttttgatgtgcttacctgtaagaaatgtcgagagc
 tgagtgcactgtggagttttgttaagttagtga

FIG._36

MEMYRGVIVQNVANFTDFANDNWCCFFQLDVEDDWPPELRGPERLMAHYICKVAALLDTPSGPFLG
 CKYFLQVEGNHFDNGFHIIHVIVGGPFLTPRNVCSAVEGGFNKVLADFTSPITITVQFKPAVSKKG
 KYHRDGFDFVITYLMPKLYPNVYISVTNLEEQYQVCSNLCYRRTMHKRQPCNGSGSVQSSVSL
 YSDGEPANKKSKVTVVRGEKFCSLVDSLIERNIFNENKWKETDFKRYAALASASVAGVHQIKTAL
 TLAVSKNCPAYLGEILFRPNTNFNIRENRRIANIFLNNYCPFLYAGKMFLAWVQKQLGKRNTI
 WLFPGPPSTGKTNIAMSLASAVPTYGVMVNNNNENFPFNDVPPYKSIILWDEGLIKSTVVEAAKSIL
 GGQPCRVQDKNKGSGVEVSGTPVLITSNSDMTRVVCNGTVTLVHQRLAKDRMVRFDLTVRCNSAL
 GLIPADEAKQWLWWAQNNACDAFTQWHLSSDHVAWKVDRITLCHDFQSEPEPDSSELPSGSGVE
 SFDRLSDLTSLWLDVQDQSSSPENDVEWDIADLLSNEHWIDDLQLESCDSPRCSPTPVAVAEPE
 VPTGTGGGLKWEKNYSVEDTNELRWPMFSDVWVWGTNVKRPVCCLEHDKFEGVHCSCLSCLSLVLE
 PMLIEKSILVDPDLTLCRCSAHGDCNTNPFVLTCKKCRDLGLMSFLEHE

FIG._37

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atggagatgtatagaggagtatttcaggtaaatgctaactttactgacttttgctaaccgataaact
 ggtgggtgctgcttttttcagtttagatgtagatgactggccggagcttagaggaccggagggct
 tatggctcactacattttgtaaaagtggctgctttactggacacccctctgggctttttgggt
 tggcaagtatttttgcaggtggaggggcaaccattttgataaagggtttcacattcatgtggtga
 ttgggggaccattttctaactctcagaataatgtgtcttctgtgtggaagggggttttaacaaagt
 gtttagcagactttacaagccctactatcactgttccagttttaacctgctgttagtataaaagggg
 aaatatcatagagatggctttgactttgttaacttactattttaatgccaaaactgtacccataatg
 ttattttacagtgttaactaaactagaagaataccagtatgtatgtaattctctctgttttagggag
 aacaatgcataaaaggcaacaaccatgtaattgggggggtctgttgaacagatccaggttttcttgg
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 ctttaaggagatgtgctgctttaaagtgtcttctgtagcaggaggttcaccaaataaaactgtctctc
 actcttgcaggtgcaaaagtgttaactctccagcttattctaggagaaatttttaactagacctaaca
 ctataaatttttaacatttagagaaaacagaaatgtctaacttttttaagtaacaactatgtccc
 tctgtatgctgggaaaatgttttttagcttgggtgcagaaacagcttggtaaaaggaatactatt
 tggctgttttggtctctccagctactggttaaaactaaacattgcaatgagtttggcctctgtgttc
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 cattatttttggggacgaggggactataaaagtccacggttggttgaagcagcaaaaagtatttta
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 tcagcagagcttgaaggatcgatggttgcgatttgatctgactgtgagatgctctaattgctctg
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 cctttactcaatggcactctgtctagtgtacggttgcctggaaagtggaccgtacaacgctgtg
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 agctttgacagaaagcgacctctcaacctcctggcttgacgtccaagatcagtcagcagctcctg
 aaaaactctgatgtcgagtgaggacatcgacagacctcctctcaaacgagcactggatcgacgacct
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 aactgagatggcctatgttttctgttgattgggtgtggggtacaaatgtttaaactgcagtggtg
 ctgttttagacacgataaaggagttttgggtgtgcattgacgtttgttctgttctgtctggtgatt
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 gtactaatccttttagcgtgcttactgttaagaaatgcccagatctgagttggttaataagagctt
 ttttagagcatgagtgga

FIG._38

MDMFRGVIQLTANITDFANDSWWCSFLQLDSDDWPELGRVERLVAIFICKVAAVLNDNPSGTSLG
 CKYFLQAEGNHYDAGFHVHIVIGGPFINARNVCNAVETTFNKVLGDLTDFPMSVQFKPAVSKKG
 EYYRDGDFVTNYLMPKLYPNVIVSVTNLEEYQYVCNSLCYRKNMHQHMVSTVDASSSFMND
 MYEPATKRSKSCYKGEKFRNLVDSLIERNIFSESKWKEVDFNEFARLSASVAGVHQIKTATT
 AVSKCNSPDYFLQLLTRPSTHFNKENRIAQIFLNNNYCPLYAGEVFLWFIQQLGRNTVWL
 YGPPSTGKTNVAMSLASAVPTGYGMVNNNNENFPFNDVYKSLILNDEGLKSTVVEAKSILGG
 QPCRVDQKNKGSVEVGTGTPVLITSNSDMTRVVWYTVTLVHQRLKDRMVRFDLTVRCSNALGLI
 PADEAKQWLWWAQSPQCDATFQWQVSEHVAWKADRTGLFHDFTSKPEQESNAKSSGKSNDSPA
 GSDLANLSWLDVEDTSSSESDLSGDIAGLVSNNDNLWQSGCPTTRCTPTVTVPVEPKQVSPGTGG
 GLTKWKNYSPVQENELAWPMFSDVWVWGSVHKRPVCCVEHDKDLVLPNCNLCLSLLEVLPMLEIE
 KSINVPDTLRCSAHGDCNPFVDLTCFKKCRDLSGLMSFLEHDQ

FIG._39

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atggacatgttccggggagttattcaactgactgctaacattactgacttttgctaaccgatagct
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 agttgctattttttattttaaagtagctgctgtatttagacaacccctctggtagacatctttggc
 tgtaaatattttttgcaggcagagggtaaatcattatgatgctgggttttcattgctcatattgtta
 ttgggggacctttcattaatgctagaaaatgtatgtaatgctgtgaaactacttttaacagggt
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 gcagttgtcaaaagttaattcaccagactatctgtttcaaattttaactagaccagtagtattct
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 caaccatgtaggggttgatcaaaagaataaaaggcaggtgtgaagtcacaggcactcctgtctcta
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 aatggcaccaggtcagtgagcacgttgccttgaaggcggaccgtacaggcttggtccatgactt
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 ggaagcgacctcgcaaatctcctcctggcttgacgttgaagatacctcgagctctctcggagctgt
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 gaccgggtgcagcaccocagttacagtggttgagccaaagcaagtttccccgggaaccgggagga
 ggattaaacaaagtgggaaaaaaatattcagttcatcaagaaaatgagctagcatggcctatgt
 ttagtgtagactgggtgtgggggttctcatgtaaaaacgcccctgtgtgctgtgtagagcatgataa
 ggaccttgtagctcctcatgttaatttgctgtctctcgcaggttgccattgttaattgag
 aaaagttataatgttccagatactttgcgatgttcagctcatgggtgattgtactaatccatttg
 atgttttaacttgtaagaagtgtagagatctcagtgcccttatgagtttttagaacatgaccagtag

FIG._40

MELFRGVLQVSSNVLDCANDNWWCSLLDLDTSDWEPLTHTNRLMAIYLSVASKLDFTGGLAG
 CLYFFQVCECNKFEEGYHIHVJGGPGLNPNRLTVCVEGLFNNVLYHLVTENVKLFPLGMFTTKG
 KYFRDGEQFIENYLMKKIPLNVVWCVTNIDGYIDTCISATFRRGACHAKKPRITAINDTSSDA
 GESSGTGAEEVVPINGKGTKASIKFQTMVNWLCENRVFTEDKWLVDNFNQYTLSSSSSGSFQIQ
 SALKLAIYKATNLVPTSTFLHLLTDFEQVMCIKDNKIVKLLLCQNYDPLLVGGQHVLRKWDKCKGK
 KNTLWFYGPSTGKTNLMAIAKSPVYGMVNNWNNENFPNDVAGKSLVVWDEGIKSTIVEAA
 KAILGGQPTRVQKMRGSAVAVPGVPVITSNIGDITFVVS GNTTTTHAKALKERMVKLNFTVRS
 SPDMLGLLTADVDQQLWTCNAQSWDHYENWAINYTFDFPGINADALHPDLQTTPIVDTTSISS
 GGESSEELSESSFNLITPGAWNTETPRSSPTIPGTSSEGSFVGSSVSVSEVVAASWEEAFYTPL
 ADQFRELLVGVVDYVWDVGRGLPVCCVQHINNNSGGGLGLCPHCINVGAWYNGWKFRFETPDVLRV
 SCHVGASNPFSVLTKCKCAYLSGLQSFVDYE

FIG._41

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atggagctatttagaggggtgcttcaagtttcttctaattgtcttgagctgtgctaacgataaact
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 aatggcaataacttcaagcagtggtgcttctaagcttgacttaccggggggcactagcgggg
 tgccttgactttttcaagtagaattgtaacaaatttgaagaaggatcatattcatgtggtta
 ttggggggcagggtttaaaccocagaaaacctcacagtgtgtgtagaggttatttaaatgt
 actttatcaccttgtaactgaaaatgtaaagctaaaatttttggcagggaatgactacaaaaggc
 aaatacttttagagatggagagcagtttatagaaaaactatttaataaaaaaataccctttaaatg
 ttgtatggtgtgttaactaatatttgatggatatatagataacctgtattttctgctacttttagaag
 gggagcttgccatgccaaagaaaccccgcataccacagccataaattgacactagtagtgatgct
 ggggagctctagcggcacaggccagaggttgtgccaatataatgggaagggaactaaagctagca
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 agtgcaactaaaactagcaatttataaagcaactaatttagtgccctacaagcacattttctatgc
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 aaactatgacccccctatttagtggggcagcagtggttaagtggtattgataaaaaatgtggcaag
 aaaaatacactgtggtttttatgggcccgaagtaacaggaatacaacttggcaattggccattg
 ctaaaagtgttccagtattatgcatggtttaactggaataaatgaaaactttccatttaagtgtg
 agcagggaaaaagcttggtggtctgggatgaaggtattattaaagctacaaattgtagaagtgca
 aaagccatttttagcggggcaacccaccagggttagataaaaaatcggtgaagtgtagctgtgc
 ctggagctacctgtggttataaaccagcaattggtgacattacttttggttgaagcggggaacactac
 aacaactgtacatgtctaaagccttaaagagcggaatggttaagtttaactttactgttaagtgc
 agccctgacatgggggttactaacagaggctgatgtacacagctggcttacatggtgtaatgcac
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 agatgcccctccaccagacctccaaaccacccccaatgtcacagacaccagtatcagcagcag
 ggtggtgaaaagctctggaagaactcagtgaaagcagcttttttaacctcatcaccocaggcgct
 ggaacactgaaacccccgcgctctagtacgccccatccccgggaccagttcaggagaatcatttgc
 cgggaagctcagtttctccggaagttgtagctgcacgtgggaagaagcctttctacacaccttg
 gcagaccagtttctgtgaactgttagttgggggttgattatgtgtgggaagggtgaagggggttac
 ctgtgtgtgtgtgtgcaacatattaaacaatgtgggggaggctgggactttgtccccattgcac
 taatgtagggggttggtataatggatggaaaatttcgagaatttaccocagatttgggtgctgtg
 agctgccatgtgggagcttctaactccctttctgtgtcaactgtcaaaaaatgtgcttacctgt
 ctggtatgcaagctttgttagattatgagtaa

FIG._42

MELFRGVLQVSSNVLDCANDNWWCSLLDLDTSDWEPLTHTNRLMAYLSSVASKLDFTGGPLAG
 CLYFFQVECNKFEEGYHHVTVGGPGLNPNRLTMCVEGLFNNVLYHLVTENVKLFLPGMTTKG
 KYFRDGEQFIENYLLKKPLSNVWVCVTNIDGYIDTCISATFRRGACHAKKPRRTTATNDTSSDA
 GESSGTGAEVVFPFNKGKFKSIKFFQTMVNWLCENRVFTEDKWLKLVDFNQYTLSSSSHSQSFIQ
 SALKLAIYKATNLVPTSTFLLHDTDFEQVMCIKDNKIVKLLLCQNYDPLLVGQHVLLKWKIDKCKG
 KNTLWFGPPSTGKTNLAMAIAKSPVYGMVNNWNNENPFNDVAGKSLVWVDEGIKSTIVEAA
 KAILGGQPTRVDQKMRGSVAVPGVPVVTISNGDITFVVSNGNTTTHAKALKERMVKNLFTVRC
 SPDMLGLTEADVQQLWTCNAQSWDHYENWAINYTFDFPGINADALHPLDQTPPIVPTDISSS
 GGSSSELSSESSFLNLITPGAWNTETPRSTPIPGTSSGESFVGSFVSSEVVAASWEAFYTPL
 ADQFRELLVGVDYVWDGVRGLPVCCVQHINNSGGGLGLCPHCINVGAWYNGWKFREFTPDLVRC
 SCHVGASNPFVSLTKCKCAYLSGLQSFVDYE

FIG._43

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atggagctatttagaggggtgcttcaagtttcttctaagtgttctggactgtgctaacgataaact
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 aatggcaatatacttaagcagttggtcttcaagcttgactttaccggggggccactagcaggg
 tgcttgactcttttccaagttagaattgaacaaattgaagaaggctatcatcttcatgtggctta
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 aaaaatcacctgttcttttatggggccgcaagtacaggaaaaaacaacaaactgtgcaatggccattg
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 aaagccatttttaggggggcaacccaccagggttagatcaaaaaatgggtgaagtgttagctgtgc
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 agatgcctccaccagacactccaaaccaccccaattgtcacagacaccagttatcagcagcag
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 cgggaagccagtttctccggaagtttagctgcacgtctggggaagaagctttctacacacctttg
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 agctgccatgtgggagcttctaactcccttttctgtgtcaacctgcaaaaaatgtgcttacctgt
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FIG._44

MFSIINPDDFWTKDKYIMLTIKGPVEWEAEIPGISTDFCKFSNVFVPHFRDMHSPGAPDIKW
 ITACTKMIDVILNYWNNKTAVPTPAKWYAQAENKAGRPSLTLLIALDGIPTATTGKHTEIRGV
 LIKDFDFDGNAPKIDDMWCYAKTRKNGGCTQVFSLSYIPFALLQIIRPQFQWAWTNINELGDVCD
 EIHKKHIIISHFNKKPNVKMLLPFKDGTNRISLKSFLGTIEWLSDLGIVTEDAWIRRDVRSYMQ
 LLTLTHGDVILHRLALSISKRRIRATRKAIIDFIAHIDTDFEYIENPVYQLFCLQSFDPILAGTIL
 YQWLSHRRGKNTVSFIIPPGGCGKSMLTGAILLENIPLHGILHGSINTKNLRLAYGQVVLVWKKDI
 SINFENHRIIISLLGGQKLIIFINENDHVQIGPCPIIATSCVDIRSMVSHNIHKNLSQRVYNF
 TFDKVIPIRNFVPIQKDDINQFLFWARNRSINCFIDYTVPKIL

FIG._45

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atgttttccataataaatccaagtgtatgtttttggactaaggacaaatatcatgttgacta
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 ctctaacgtgcccggtgccacatttttagagatatgcactcaccgggagcgcccgatattaaatgg
 ataactgcattgtacaaaatgtagtgatgtcactcaattactggaataataaaactgccgtcc
 ccacccctgcaaagtggtagcgtcacaagcgggagaataaagctggcgagaccctccttaacattatt
 gatagctttagatggaattccaccgcaacgataggaaaacacacaacggaaatcaggggtgta
 ttaattaaagatttcttcgacgggaacgccctaaaaatagatgattgggtgcacgtatgccaaaa
 caaagaaaaatgggtggcggaacccaggtcttcagtcataagttatatccctttgcccctcttcca
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 gtctgatcttggaaatagtcacggaagacgctggatcgaagagacgttagatcatacatgcaa
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 acatttgataaagttatccctcgcaattttcctgtaattcagaaaagacgacataaattcaatttc
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FIG._46

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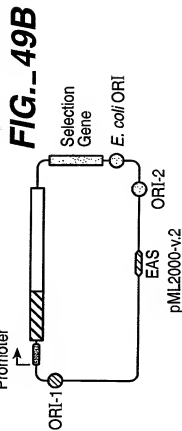
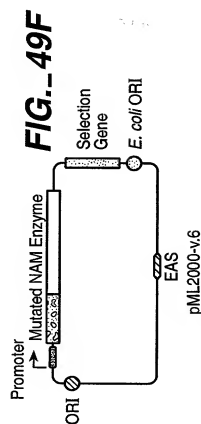
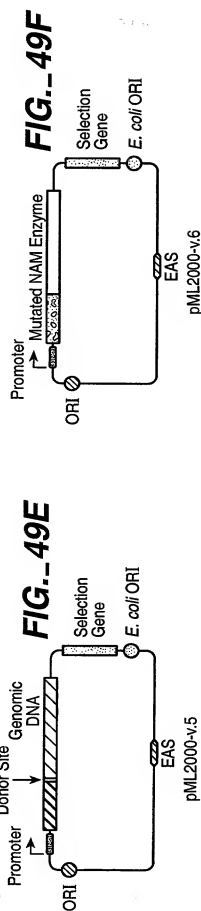
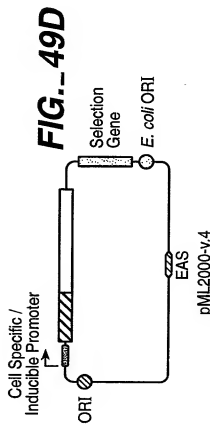
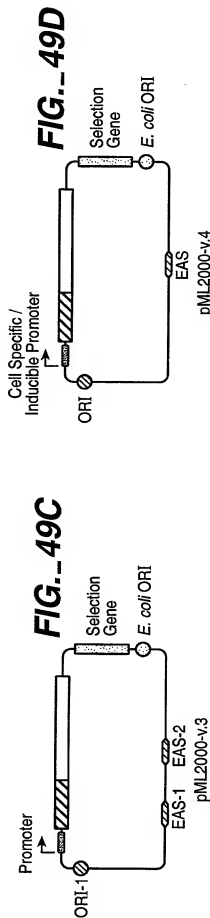
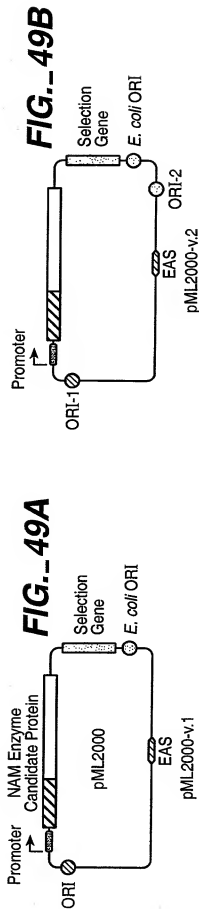
FIG._47

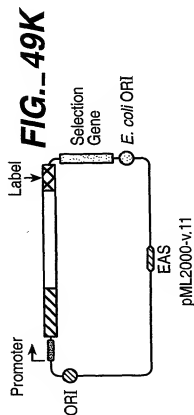
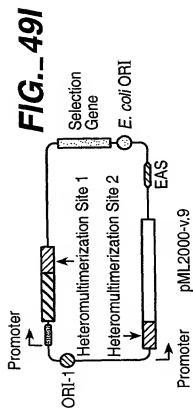
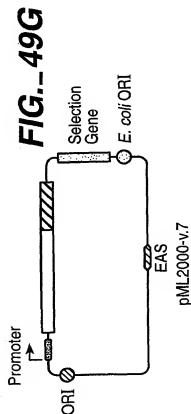
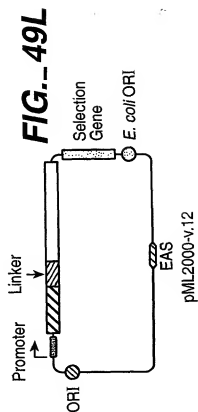
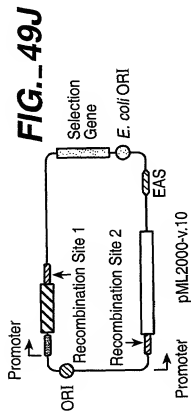
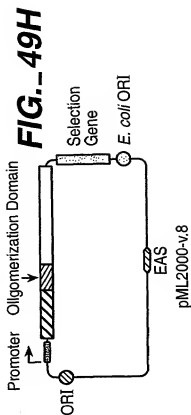
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FIG._48

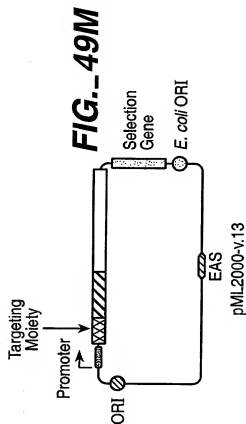
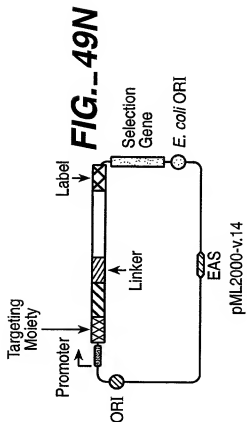
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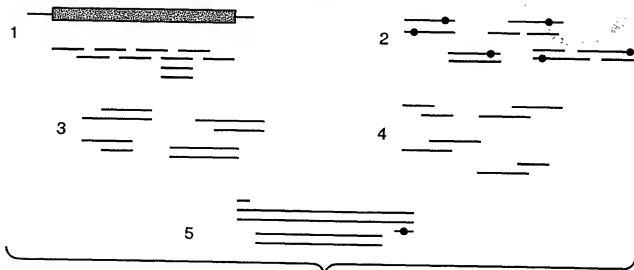


FIG._50

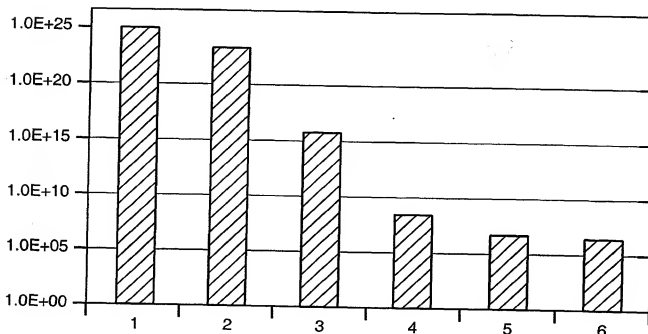


FIG._51

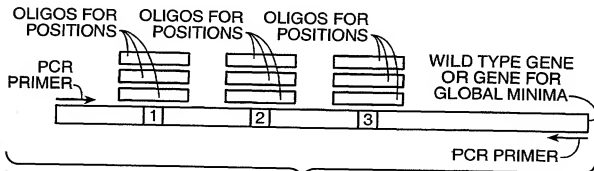
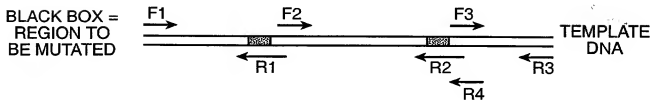


FIG._52

10082671.051702

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STEP 1: SET UP 3 PCR REACTIONS:

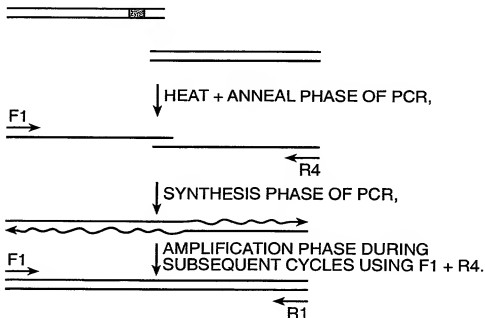
PRODUCTS:

TUBE 1:

TUBE 2:

TUBE 3:

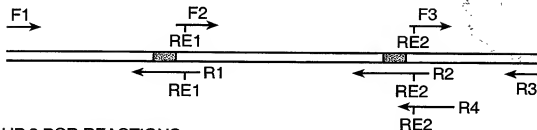
STEP 2: SET UP PCR REACTION WITH PRODUCTS OF TUBE 1 +
PRODUCTS TUBE 2 + F1 + R4.



STEP 3: REPEAT STEP 2 USING PRODUCT FROM STEP 2 + PRODUCT
FROM STEP 1, TUBE 3 + PRIMERS F1 + R3.

FIG. 53

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STEP 1: SET UP 3 PCR REACTIONS:

TUBE 1: A horizontal DNA template with a single restriction site labeled RE1.

TUBE 2: A horizontal DNA template with two restriction sites labeled RE1 and RE2.

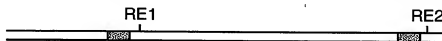
TUBE 3: A horizontal DNA template with a single restriction site labeled RE2.

STEP 2: DIGEST PRODUCTS FROM STEP 1 WITH SUITABLE RESTRICTION ENDONUCLEASES.

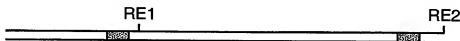
STEP 3: LIGATE DIGESTED PRODUCT FROM STEP 2, TUBE 2 WITH DIGESTED PRODUCT FROM STEP 2, TUBE 1.



STEP 4: AMPLIFY VIA PCR LIGATED PRODUCTS OF STEP 3 WITH F1 + R4.



STEP 5: DIGEST AMPLIFIED PRODUCT OF STEP 4 WITH RESTRICTION ENDONUCLEASE #2.



STEP 6: LIGATE PRODUCT FROM STEP 5 WITH PRODUCT FROM STEP 2, TUBE 1.



STEP 7: AMPLIFY PRODUCT FROM STEP 6 WITH F1 + R3.

FIG. 54

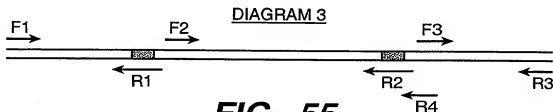


FIG. 55

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Amplification Scheme Based on M13 Single Stranded Template

Amplification Scheme & Math

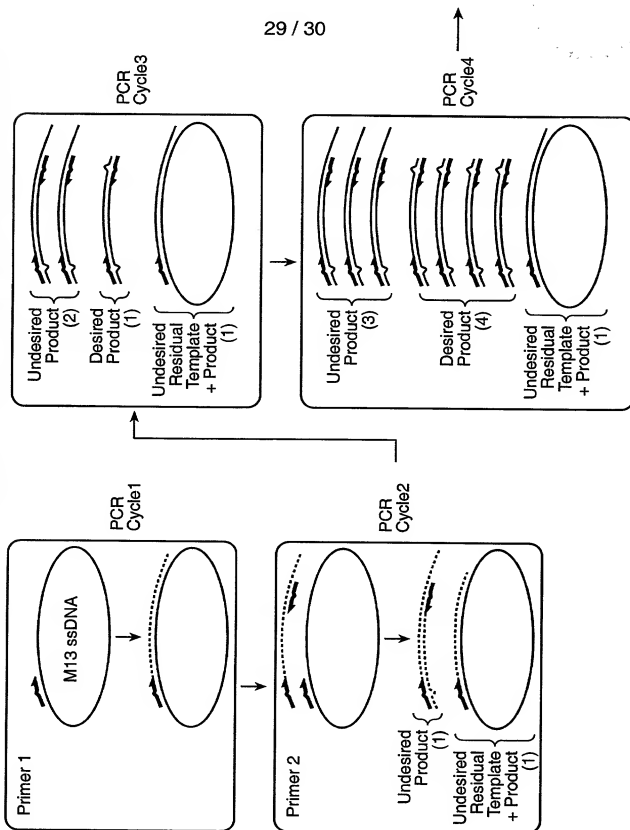


FIG._56A

FIG. 56B**Amplification Scheme Based on M13 Single Stranded Template**Numerical Progression of Desired Product
with Increasing PCR Cycles

PCR Cycles	Desired Product	Undesired Products and Residual Template	Percent Desired Product in Total Product
1		1	
2	0	2	0.00%
3	1	3	25.00%
4	4	4	50.00%
5	11	5	68.75%
6	26	6	81.25%
7	57	7	89.06%
8	120	8	93.75%
9	247	9	96.48%
10	502	10	98.05%
11	1013	11	98.93%
12	2036	12	99.41%
13	4083	13	99.68%
14	8178	14	99.83%
15	16369	15	99.91%
16	32752	16	99.95%
17	65519	17	99.97%
18	131054	18	99.99%
19	262125	19	99.99%
20	524260	20	100.00%

